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The structure of smooth mappings over Weil algebras and the category of manifolds over algebras

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Abstract

As is known, the bundle TAMn of infinitely near points of A-type defined for any local Weil algebra A and smooth real manifold Mn is one of basic examples of smooth manifolds over A. In the present paper we give a description of the local structure of smooth mappings in the category of smooth manifolds over local algebras and consider various examples of such manifolds. Next we study the homotopy and holonomy groupoids of a smooth manifold Mn A over a local algebra A associated with canonical foliations corresponding to ideals of A. In particular, it is proved that a complete manifold Mn A has neither homotopy nor holonomy vanishing cycles.